

## Best Practice in Workplace Health Surveillance

### AUSTRALIAN COAL MINING HEALTH SURVEILLANCE PROGRAMS

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#### **Abstract**

The range of mining industry health surveillance programs in Australia has been described in a project on the feasibility of a national mining health database. Culture and legislation contribute to wide variations in existing programs ranging from centralised schemes to company managed programs and programs that have elements of both. The challenges of mounting effective health surveillance include:

- involvement of employers, unions and government,
- confidentiality of medical information,
- reliability and consistency between medical assessments
- a reliable and confidential central storage facility
- an electronic format to facilitate retrieval and analysis
- flexibility to enable provision of service to meet client needs
- reliable and valid collection of exposure data
- mechanisms to track exposures of individual miners.

Health and safety management in Australia is managed at the state level where six states and a territory have separate legislation and administration. There are regular meetings at a senior level to promote consistency of standards between jurisdictions. While all states now have the legislation based on similar 'duty of care' models, the approaches to health surveillance vary markedly. In the major mining states of New South Wales, Queensland and Western Australia where the mining unions are a strong political force, centralised monitoring programs were established some years ago.

Over the years, various weaknesses of the original health schemes became apparent and many but not all of the above criteria have been incorporated into the programs in these states. In the other states where mining is a relatively small industry, mining health surveillance has not been approached in a coordinated manner. The mining sector in these states has developed in a similar way to that in general industry where coordinated programs are difficult.

#### **Current State Legislative Basis of Health Databases**

In most states in Australia, there is legislation requiring health surveillance to be undertaken for miners exposed to occupational hazards. Table 1 summarises these requirements.

Only the states with centralised systems maintain databases. Where the responsibility for health surveillance lies with the employer who also keeps the records, access to collective information is very difficult.

South Australia is in the process of establishing a centralised health surveillance system. This system is being established by the Mining and Quarrying Occupational Health and

Safety Committee under Worker's Compensation legislation. The final arrangements are currently the subject of contract negotiations.

**Table 1**  
**Summary of State Health Surveillance Requirements**

STATE	COAL	METALLIFEROUS, NON-COAL
Queensland	Centralised system required by regulation	Employer responsibility
New South Wales	Centralised system required by regulation	Employer responsibility
Western Australia	Centralised system by Regulation	
Northern Territory	Not applicable	Employer responsibility
Tasmania	Employer responsibility	
Victoria	Employer responsibility	

### **Health Surveillance in Mining in Australia**

The initial objective of health surveillance was to acquire a comprehensive data system that reliably measured the long term health status of the workforce. The change towards duty of care style legislation has introduced the need for employers to ensure their workforce is fit to undertake duties and are not being harmed by exposure to occupational hazards.

Although the health programs in different states appear to have significantly different legislative and historical environments, there is a common thread to their development. In most cases, the health schemes have developed out of the mining-related respiratory disease prevalent up to the 1950s. Since then, advances in dust monitoring and ventilation technology, and changes to legislation have reduced dust exposure. As the prevalence of serious respiratory disease dropped, other occupational health issues became apparent. Issues such as hearing loss and musculo-skeletal injuries were identified.

Many of the disorders suffered by miners also occur in the general population. A key element in health surveillance should be to collect statistical evidence of the prevalence of various disorders to assess whether miners are being harmed by the work environment. Where differences to the general population are detected, contributing factors, exposures and confounding factors need to be identified and assessed.

Recent developments in information technology and the change in the nature of mining have created an opportunity for the development of centralised health surveillance systems. In the states with the larger mining industries, such centralised systems have developed with a degree of cooperation between employers, Unions and the Government.

## **Key Elements in Current Health Programs**

### **(a) New South Wales**

Health surveillance in the coal industry in New South Wales, is undertaken by the Joint Coal Board which is a tripartite quasi-autonomous government authority. Established with broad powers of authority, the JCB operates the coal industry worker's compensation program, health surveillance and general occupational health services. The current health surveillance requirements were established as a guideline called 'Alnewcoal 105' (Joint Coal Board 1989).

The Coal Mining Regulations require persons who undertake statutory functions to be certified that they are medically fit to undertake their duties.

Data captured includes respiratory function, eyesight and hearing testing. The program was expanded in 1989 to include occupational history, blood pressure, urinalysis, musculo-skeletal assessment and basic fitness for work in the industry.

### **(b) Western Australia**

The health surveillance program in Western Australia was shaped by the respiratory problems from asbestos and gold mining.

Testing still focuses on a respiratory questionnaire, spirometry and a chest X-ray and now includes eyesight and hearing testing. A feature of the Western Australian program is that health monitoring is linked to monitoring of exposures to atmospheric contaminants. Maintaining this link is challenging but lies at the core of duty of care principles.

### **(c) Queensland**

Centralised health surveillance was first established by the Queensland Coal Board in 1983 as a pre-employment program. This program focussed on respiratory disorders and included eyesight and hearing testing. The program was expanded in 1993 to include medical and occupational history, blood pressure, urinalysis, musculo-skeletal assessment and fitness for duty. This scheme introduced Nominated Medical Advisers who were appointed by the mines and approved by the Regulators. This Queensland Coal Industry Employees' Health Scheme 1993 established a link between the mine operators and medical practitioners who were obliged to take an interest in the wider aspects of mine workers health management.

The health scheme provided for all workers to have pre-employment and periodic health assessments. These are required at a maximum period of 5 years.

## **Current use of Data**

Given the timeframe over which health data has been collected in Australia, and given the type of data collected, the various agencies could have been able to use the data to identify industry health trends. Due to the nature of the current state systems, this has not yet come to fruition.

Some example of the limited use made of the current data sets are:

- A survey of respiratory disorders in Queensland was reported by Rathus and Abraham, (1984). 75 cases of pneumoconiosis were identified from a workforce approximately 3000 strong. Most of those affected were underground workers with many years experience in hand mining.
- The Joint Coal Board (1991) published data on the progression of pneumoconiosis in Southern District longwalls.
- De Klerk and Musk (1998) analysed dust and respiratory data collected from 1961 to 1997 in Western Australia. The results indicated that tobacco smoking contributed significantly to the severity of dust related respiratory disease.
- Ham (2000) examined the respiratory, hearing and blood pressure data from the Queensland data. The workforce was stratified by age group and smoking status where relevant. In this project, links were established between the health database and the lost time accident database.
- The Joint Coal Board (2001) published selected data extracted from the health database including the age distribution of the workforce. This allows an analysis of injuries and disorders as a percentage by age group.

The strengths and limitations of the centralised health surveillance programs in New South Wales, Western Australia and Queensland lead to some interesting comparisons. A system that incorporates the strengths of all three systems would represent a significant step forward in occupational health surveillance.

### **Strengths of the Current Systems**

The strengths of the current systems may be grouped as follows;

- (a) Fitness for duties
- (b) Transportability of health assessments
- (c) Annual employment census
- (d) Exposure data linked to health data

The Queensland system has established a close rapport between the mines and their Nominated Medical Advisers. The health assessment includes an assessment of a coal miner's fitness to undertake specific duties. The legislation provides a degree of flexibility for the medical advisers to report work restrictions that result from medical conditions.

The New South Wales system includes a mechanism for tracking the employment of miners through an annual census of all the mines. Reciprocal arrangements exist between health assessments in Queensland and New South Wales.

The Western Australian system has established a link between the exposure and the health surveillance data. Under regulation, data on exposures to atmospheric contaminants is recorded on a standard form with occupation and location data as well as the employee identification number.

## **Elements of Effective Health Surveillance Systems**

Limitations of the current systems may be grouped as follows;

- (a) Objectives
- (b) Data collected
- (c) Data management
- (d) Analysis
- (e) Reporting

### ***(a) Objectives***

Most of the current health databases were developed before the enactment of duty of care legislation. Government authorities need to take a lead in health surveillance particularly where the effects of the occupational exposure are manifest over a long period. Most databases were designed around some specific known disorders, however, under duty of care, the concept of harm is very broad and the databases need to reflect this change.

### ***(b) Data collected***

The majority of data collected in health databases is personal medical data. The approach taken in Western Australia shows that the health data can be collected in conjunction with related exposure data to determine potential cause and effect.

### ***(c) Data management***

Data management focuses on the handling of data within the database. Common problems that occur include:

- Identification of individuals – persons are entered twice or records come with different names or dates of birth;
- Failure to record contractor information;
- Errors in data entry;
- Missing values in medical or other data;
- Inconsistencies in classification of occupations;
- Failure to effectively record occupation exposure history.

### ***(d) Analysis***

Analysis of the data needs to address the various elements, research methods and threats to validity. Without being immersed in a flurry of academic argument, it is sufficient to say that the results should be interpreted with a degree of caution. Possible confounding factors should be considered carefully - generalising may not be valid.

**(e) Reporting**

The current reporting on the numbers of assessments undertaken is a useful measure of the progress of health assessments but more in-depth analysis is required to demonstrate the potential benefits of research using mining health databases.

The second factor affecting reports from the health databases is the lack of available funding for analysis. In comparison with the media grabbing traumatic injuries and fatalities, long term health issues struggle to gain support to undertake the required work. It should be noted that in a National Occupational Safety and Health Commission study, Foley (1998) concluded that for every traumatic work-related death, there were five deaths caused by work related illnesses.

**Conclusions**

To achieve an effective health surveillance program, workers, management and government need to work cooperatively to establish common desired processes and outcomes.

The confidentiality of medical information, needs to be established so that an atmosphere of mutual trust can develop. While confidentiality needs to be maintained, employers need to access advice on the medical suitability of workers to undertake their set tasks. Duty of care obligations place the onus on employers to demonstrate that poor health outcomes have not been caused or exacerbated by the work activity or environment.

The government needs to obtain sufficient statistical data to confirm the current exposure guidelines are proving effective in ensuring workplace health and safety. In order to achieve this reliability and consistency between medical assessments and exposure data is needed. This includes a mechanism to track exposures of individual miners. In order to collate such long term data, a reliable and confidential central storage facility needs to be able to extract data in an electronic format to facilitate analysis.

If a centralised system is developed, it needs flexibility to enable provision of service to meet client needs. This includes transportability of health assessment data to enhance workplace mobility and reduce costs. Health and safety professionals need feedback from health data to target effective programs.

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My understanding of mining health surveillance has been moulded by my activity with the Health Surveillance Unit within the Department of Natural Resources and Mines. The views expressed are my personal views and do not necessarily represent those of the Department, SIMTARS or other persons associated with mining health surveillance in Australia.

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